Five-Year Review Report

Michigan Disposal Service (Cork Street) Landfill Superfund Site
Kalamazoo, Michigan

Pursuant to CERCLA

Prepared by:
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Region 5
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12-10-04
Date

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
MDEQ	Michigan Department of Environmental Quality
MCL	Maximum Contaminant Level
NPL	National Priorities List
O&M	Operation and Maintenance
PRP	Potentially Responsible Party
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
USEPA	United States Environmental Protection Agency
USDOJ	United States Department of Justice

Executive Summary

The remedy for the Michigan Disposal Service Superfund Site consisted of re-compacting a clay layer, adding a 24 inch protection layer, 6 inch vegetation layer and gas vents over a 22 acre portion of the landfill, constructing a new cap over the remaining 30 acres consisting of a 6 inch vegetation layer, 24 inch frost protection layer, geosynthetic clay liner and gas venting layer. Additionally, the remedy included installation of a RCRA Subtitle D cover for surface containment of waste materials, an extension of the leachate collection system, and monitoring wells for periodic monitoring in accordance with the Groundwater / Surface Water Interface Monitoring Plan. Institutional controls include fencing, signage, notice to future property owners, and deed restrictions to regulate development and groundwater use restrictions.

The assessment of this five-year review found that the remedy was constructed in accordance with requirements of the ROD and the final ROD Amendment. The remedy is functioning as designed. The immediate threats have been addressed and the remedy is expected to be protective as long as it is maintained and monitored and an IC plan is implemented.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Michigan Disposal Service Superfund Site aka Cork Street Landfill		
EPA ID *(from WasteLAN)*: MID000775957		
Region: 5	**State:** MI	**City/County:** Kalamazoo County
SITE STATUS		
NPL status: Final		
Remediation status Complete		
Multiple OUs?* NO	**Construction completion date:** 09/28/2002	
Has site been put into reuse? NO		
REVIEW STATUS		
Lead agency: USEPA Region 5		
Author name: Jon W. Peterson		

Author title: Remedial Project Manager	**Author affiliation:** USEPA
Review period:** 12/01/1999 to 12/01/2004	
Date(s) of site inspection: October 13, 2004	
Type of review: Post SARA	
Review number: First	
Triggering action: Initiation of Remedial Action	
Triggering action date *(from WasteLAN)*: December 1, 1999	
Due date *(five years after triggering action date)*: December 1, 2004	

Five-Year Review Summary Form, cont'd.

Issues:

None.

Recommendations and Follow-up Actions:

Conduct reviews at minimum 5-year intervals to ensure the remedy maintains its protectiveness.

Protectiveness Statement(s):
The remedy at the Michigan Disposal Site is protective of human health and the environment.

Other Comments:

U.S. Environmental Protection Agency
Region 5
Five Year Review Report
Michigan Disposal Service (Cork Street) Landfill Superfund Site
Kalamazoo County, Kalamazoo, Michigan

I. INTRODUCTION

The purpose of a five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The United States Environmental Protection Agency (USEPA) conducted the five-year review of the remedy implemented at the Michigan Disposal Superfund Site in Kalamazoo, Michigan ("the Site"). This review was conducted by the Remedial Project Manager (RPM) for the entire Site in October 2004. This report documents the results of the review.

This is the first five-year review for the Site. The triggering action for this statutory review is the Initiation of the Remedial Action for the Site in December of 1999. The five-year review is required because hazardous substances, pollutants, or contaminants remain at the above levels that allow for unlimited use and unrestricted exposure. This review will be placed in the Site files and local repositories for the Michigan Disposal Service Superfund Site (the "Site") in Kalamazoo County, Kalamazoo, Michigan. The repository is located in Kalamazoo, Michigan.

II. CHRONOLOGY

Event	Date
USEPA Proposes Michigan Disposal Service Site to NPL	10/15/84
NPL Listing becomes Final	02/21/1990
PRP Lead RI/FS Begins	06/04/1987
Remedy Selected in Record of Decision	09/30/1991
PRP Remedial Design begins	06/12/1998
PRP Remedial Action begins	12/01/1999
ROD Amended to eliminate pump and treat	09/25/2002
Preliminary Completion Report based on ROD Amendment	09/25/2002
1st Five-year Review initiated	10/04
Five-year Site visit	10/13/2004

III. BACKGROUND

Physical Characteristics

The Site consists of approximately 68 acres located in Kalamazoo County, Michigan. The Site is an inactive landfill located in Kalamazoo, Michigan. The Site is bounded on the south by Interstate 94, on the west by Conrail Railroad, on the north by Cork Street and the Lakeside Refinery Co., and on the east by Davis Creek and the Grand Trunk Railroad. Davis Creek is not used recreationally.

Land and Resource Use

The immediate area surrounding the property is industrial with the surrounding area being used as mixed industrial, commercial and residential. The nearest residences are approximately one-quarter of a mile from the Site.

History of Contamination

During its operation from 1925 to 1961, the property was owned and operated by private parties as a general refuse municipal landfill. In 1961, the City of Kalamazoo bought the property and began accepting wastes from local residents, businesses and industries. A tee-pee shaped incinerator, called a Wilco burner, was used to incinerate a majority of the waste with the ash being deposited on Site. In 1968, the Site became licensed by the state to receive only inert waste, and incineration ceased at the Site to comply with new air pollution regulations.

Also, at that time, the landfill was closed for public use. However, the City continued to dispose of its own inert waste there until 1981. In March of 1981, the City sold the property to Dispos-O-Waste, now known as Michigan Disposal Service Corporation.

Initial Response

The Site was proposed for the National Priorities List (NPL) in June of 1987. On December 3, 1987, the City of Kalamazoo, MDS and the U.S. EPA entered into a Consent Order (EPA Docket No. V-W-87-C-035) for the City and MDS (Respondents) to perform the Remedial Investigation and Feasibility Study (RI/FS). The Site was finalized on the NPL in February of 1990.

The predominant contaminants that were identified during the 1987 RI/FS included heavy metals, volatile organic compounds (VOCs), polynuclear aromatics (PNAs), and several other semivolatile organic compounds (SVOCs). The 1998-1999 groundwater samples yielded detectable concentrations of heavy metals and VOCs.

In July 1991, USEPA and MDEQ issued a proposed plan for public comment. The proposed remedy consisted of groundwater extraction and leachate collection with treatment and discharge to the City of Kalamazoo publicly-owned treatment works (POTW), and closure and containment of the landfill, including installation of a gas venting system, monitoring of groundwater wells, fencing and institutional controls.

USEPA and MDEQ held a public meeting on July 17, 1991, in Kalamazoo to solicit comments on the proposed plan. A public comment period was held from July 11, 1991, to September 8, 1991. USEPA and MDEQ responded to both verbal and written comments received on the proposed plan. On September 30,1991, U.S. EPA issued a Record of Decision (ROD), including a responsiveness summary for the Site, which embodied the proposed remedy, as outlined above.

The USEPA Amended the 1991 ROD in September 2002. The ROD Amendment relied upon information collected in the pre-design studies, in conjunction with supplemental groundwater quality and stream flow data analysis, which provided data to support changes in the cleanup action for groundwater at the Site. Based on these data, the current Groundwater/Surface Water Interface (GSI) quarterly monitoring, and the June 1995 amendments to Part 201 of Michigan Act 451, the USEPA concluded that a feasible response for Site groundwater would be to monitor and periodically re-evaluate the groundwater discharge across the GSI into Davis Creek

Basis for Taking Action

In addition to the closure of a solid waste landfill in accordance with solid waste regulations, the Record of Decision in 1991 and the ROD Amendment in 2002 had the following Remedial Action Objectives (RAOs) for the remedy selection at the Michigan Disposal Service Landfill Site:

- Prevent or reduce the release of contaminants from the landfill into the various environmental media including air, groundwater, surface water and sediment of Davis Creek.

- Ensure that chemical-specific applicable or relevant and appropriate requirements (ARARs) are not exceeded outside the boundaries of the landfill;

- Prevent or reduce off-Site migration of contaminated groundwater;

- Prevent or reduce the potential risk to human health associated with exposure to contaminated groundwater and /or landfill waste at the Site.

IV. REMEDIAL ACTIONS

Remedy Selection

The major components of the final remedy discussed in the Record of Decision as amended were:

- Upgrading the previously capped 22-acre portion of the landfill by re-compacting the clay layer, and by adding a 24-inch protection layer, 6-inch vegetation layer and gas vents; and

- Construction of a new cap on the remaining 30-acre portion of the landfill consisting of 6-inch vegetation layer, 24-inch frost protection layer, geosynthetic clay layer (GCL) and gas venting layer in accordance with MDEQ Standards and RCRA Subtitle D cover requirements for the surface containment of the waste material;

- Land use restrictions to prevent contact with waste and groundwater use restrictions to prevent ingestion of contaminated groundwater;

- *Installation of an extension* to the leachate collection system.

- Installation of monitoring wells and performing periodic groundwater monitoring as detailed in the January 2002 Groundwater/Surface Water Interface (GSI) Monitoring Plan. The following contingent remedy for groundwater treatment is also selected for the Site: design and implementation of a groundwater extraction system with discharge to the City of Kalamazoo's Publicly Owned Treatment Works (POTW) if monitoring indicates that there are long-term exceedances in the GSI monitoring wells; and,

- Installation of fencing and warning signs to restrict access.

Remedy Implementation

On May 14, 1998, U.S. EPA issued a Unilateral Administrative Order to the Respondents to perform the Remedial Design/Remedial Action (RD/RA) phase of the cleanup activities for the landfill cap component as described in the ROD.

Pre-design (pre-RD) field activities began in January 1998 and were completed by the Respondents in January 1999. The work was performed in compliance with the ROD, the AOC, and in accordance with the Work Plan that the U.S. EPA and MDEQ approved in October 1997. These

studies included vertical profile sampling and monitoring well installation, groundwater sampling and analysis, wetland delineation and sampling, a groundwater utilization study, waste delineation survey and pre-design report. The purpose of these studies was to develop sufficient data to estimate the horizontal and vertical extent of groundwater contamination at the facility, qualitatively assess potential impacts to public health and environmental receptors of any Site-related contamination, and determine the extent of waste over which the surface cap is to be constructed. The groundwater studies showed that the quality of groundwater discharging from the Site is not causing an environmental risk to Davis Creek. The groundwater study provided data to support the MDEQ's Mixing Zone Determination (MZD) evaluation and approval.

Groundwater has been impacted due to recharge through landfill waste from the Site. The predominant contaminants that were identified in the 1991 ROD included heavy metals, VOCs, PNAs, and several SVOCs. The 1998-1999 groundwater samples yielded detectable concentrations of heavy metals and VOCs that exceed Generic GSI criteria at monitoring wells located adjacent (i.e. within 20-30 ft) to Davis Creek. Although GSI criteria were exceeded at some Site monitoring wells that were sampled in 1998 and 1999, new point of compliance monitoring was established in 2001. A Mixing Zone Determination (MZD) was conducted to establish Site specific GSI criteria to protect Davis Creek, and additional point of compliance wells were installed at more appropriate locations closer to the creek. Although the GSI criteria have been exceeded at some monitoring points located in the landfill portions upgradient from the creek, the MZD criteria have not been exceeded at point of compliance wells to date, nor is it expected that the MZD standards will be exceeded at the point of compliance wells in the future.

The landfill cap construction field activities began in late April 2000 and were completed at the end of June 2002. The construction activities performed at the Site included the following: mobilization and startup; temporary facilities and controls; Site clearing, grubbing, and topsoil stripping, structural demolition; waste excavation and relocation; paper mill sludge stabilization, elimination of on-Site wetlands, soil erosion and sediment control measures; cap upgrade for 22-acre portion; multi-layer landfill cap construction for 30-acre portion; grouting of waste below 42-inch sanitary sewer; access roads, culverts,and drainage ditch construction; passive vent construction; chain link fences and gates; Site restoration including seeding and mulching; and, demobilization.

V. PROGRESS SINCE LAST FIVE-YEAR REVIEW

This is the first Five Year Review for this Site.

VI. FIVE-YEAR REVIEW PROCESS

Administrative Components

The Michigan Disposal Service five-year review team was led by Jon Peterson of the USEPA, currently assigned as Project Manager for the Michigan Disposal Service Superfund Site. David Linnear and Stephanie Ball, who were previously assigned as Project Managers on the Site, David Novak, the USEPA Community Involvement Coordinator from USEPA, Mary Schafer, State

Project Manager with the Michigan Department of Environmental Quality (MDEQ), Gavin O'Neill and Matt Downing, from Conestoga-Rovers and Associates also assisted in the five-year Review process for this Site.

The five year review consisted of a Site inspection and review of relevant documents. The completed report will be available in the Site information repository and the USEPA website for public view.

In October and November 2004, the review team accomplished the following tasks:

- Document Review;
- Data Review;
- Community Involvement ;
- Press Release;
- Site Inspection;
- Five-Year Review Report Development and Review

The public was notified of the five-year review in October 2004 through a press release and newspaper ad.

Document Review

The document review analyzed the following records: Record of Decision, ROD Amendment, Groundwater Surface Water Interface Monitoring Plan, Operation and Maintenance Plan, GSI Monitoring Reports, various Correspondence.

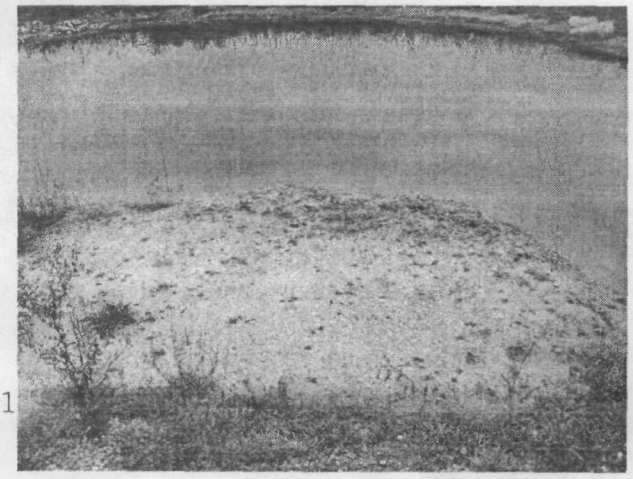
FIVE YEAR REVIEW FINDINGS

The Michigan Disposal Service Site visit was performed on October 13, 2004, in order to inspect the Site for this five year review. Jon Peterson of U.S. EPA and Mary Schafer of MDEQ were present during the June inspection, as well as Gavin O'Neill and Matt Downing of CRA.

The landfill cap was in good condition with covered vegetation, and showed no excessive wear, extensive erosion gullies nor surface breaks. The 2003 landfill construction repair activities seemed to be effective in maintaining cap integrity, surface drainage and runoff. The fencing around the perimeter of the Site appeared to be in good shape and signs were clearly posted.

Minor issues included the following:

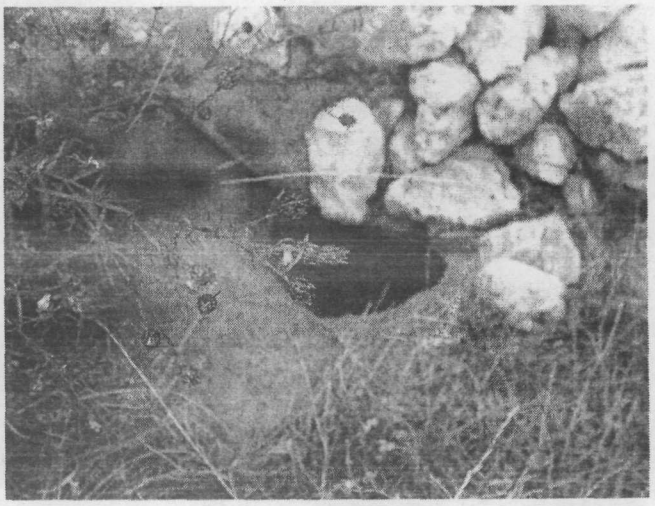
An area around the Sedimentation Pond No. 2 / Wetland that had sloughed into the artificial wetland and been repaired appeared to be beginning to experience continued stresses. Gavin O'Neill discussed how the surface drains all come together underground at this point and speculated that during a large rain event, the



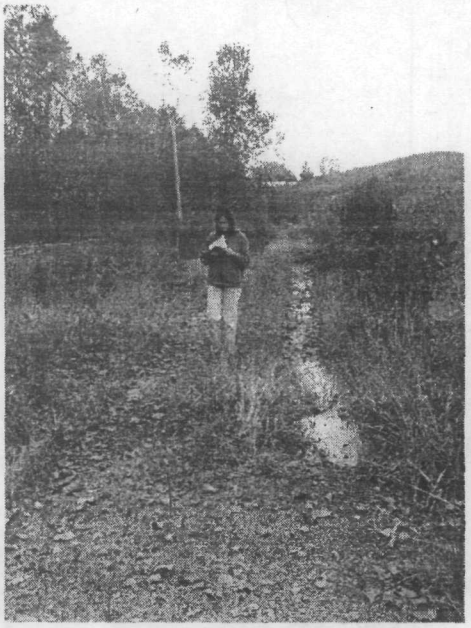
combined flow would dislodge the fine grained material that the contractor had used previously to repair the sloughed area. Mr. O'Neill stated that a request would be made to the contractor to fix this area and install rip–rap that could handle more flow without eroding.

Four of the deep passive landfill gas vents near the top of the landfill were emitting steam and were very hot. The wind vanes on these vents were also very corroded. The O&M Plan calls for corroded wind vanes to be replaced.

Minor burrowing was observed in several locations on the landfill.



An area along the eastern edge of the landfill, adjacent to the area where the old leachate collection trench meets the new leachate collection trench continues to be moist at the surface as shown in the pictures below.



VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents? YES

Nothing observed at the Site would be an imminent threat to the integrity of the cap and the fence around the Site is intact and in good condition.

***Question B:* Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid? YES**

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy.

Changes in Standards and Things to be Considered

As the remedial work has been completed, most ARARs or performance standards cited in the ROD and ROD Amendment have been met.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy? No

There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the Site inspections, the remedy is functioning as intended by the ROD, as amended. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

However, there is a lack of necessary monitoring information which is needed to positively affirm the protectiveness of the remedy. Since the O&M plan had not been approved, the perimeter gas monitoring system still has to be installed. Consequently, there is no data to show that lateral migration of landfill gas is not taking place.

VIII. ISSUES

The sloughing problems near sedimentation basin No. 2 / wetland were repaired by covering the low area with soil but another sloughed area is beginning to develop.

The area of moisture on the east side of the landfill along the access road could possibly be from a minor leachate outbreak given its proximity to the "old" leachate collection trench that stops just adjacent to the "new" leachate collection trench.

The Groundwater/Surface Water Interface Monitoring Plan does not give a standard for zinc, although zinc has been detected above Generic GSI criteria in monitoring wells that are known to be constructed of galvanized materials.

The Operation and Maintenance Plan had not been approved until November 19, 2004. Upon approval of the O&M Plan, gas probes will be installed along the perimeter of the landfill. However, since there has been no perimeter gas probe monitoring to date, it is impossible to say with any certainty that the landfill gas is not migrating off-Site.

INSTITUTIONAL CONTROLS

Finally, a review of institutional controls shows that deed restrictions were recorded by the owner. These restrictions prohibit, among other things, disturbance of the cap and installation of wells. However, these proprietary controls amount to a deed notice and may not be effective in the long term.

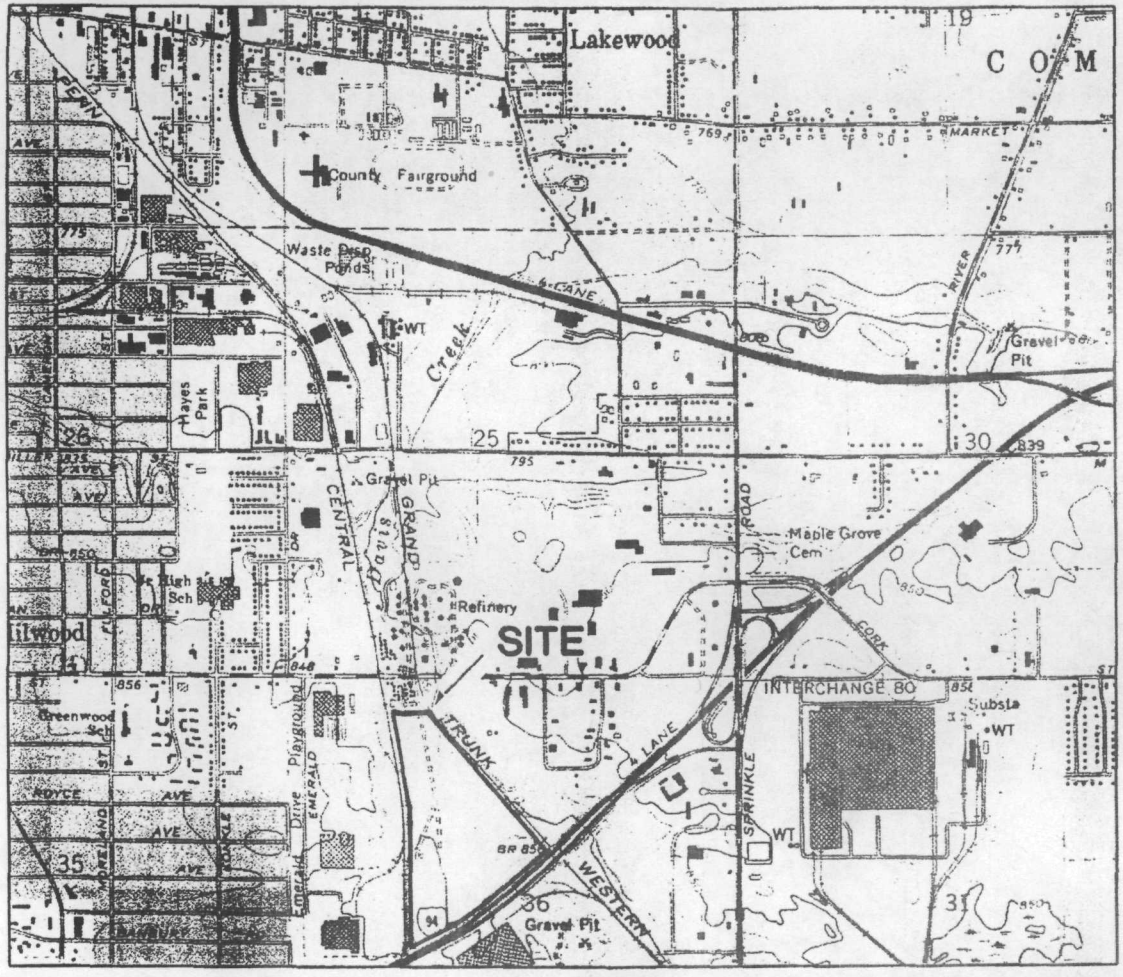
Recommendations / Follow-up Actions	Responsible Party	Oversight Agency	Milestone Date	Affects Protectiveness	
				Current	Future
Continue maintenance of the remedy components and continue to perform 5-year reviews to ensure these requirements are maintained.	*PRPs*	*MDEQ*	*As Necessary*	*N*	*Y*
To address the sloughing problems near sedimentation basin No. 2 / wetland, we recommend that the area be repaired and consider the use of rip-rap, instead of soil, to prevent this from occurring in the future.	*PRPs*	*MDEQ*	*Within 6 months of this 5 year review*	*N*	*Y*
To address the area of moisture on the east side of the landfill, we recommend that a workplan be developed to ascertain if this moisture represents leachate or simply moisture from surface drainage.	*PRPs*	*USEPA*	*Within 2 months of this 5 year review*	*N*	*Y*
To address the zinc exceedances, we recommend that the wells constructed of galvanized materials be replaced with wells constructed of some other material which will not contain or contribute to groundwater zinc, or any of the contaminants of concern from the Site. Then a period of monitoring for 3 quarters should be conducted to determine if zinc levels have remained above the generic GSI criterion. If the criteria are exceeded, contingency actions as described in the ROD Amendment should be performed.	*PRPs*	*USEPA*	*Within 1 month of this 5 year review*	*N*	*Y*
To address the lack of data from gas monitoring probes, the O&M plan was approved on November 17, 2004.	*PRPs*	*USEPA*	*NA*	*Y*	*Y*
To address the potential long-term ineffectiveness of the deed restrictions on the Site property, it is recommended that an institutional control ("IC") plan be submitted within 6 months of this 5-year review. The IC plan will develop a strategy for obtaining restrictive covenants or easements that run with the land and thereby prohibit disturbance of the cap and groundwater use at the Site.	*PRPs*	*USEPA*	*6/30/05*	*N*	*Y*

X. PROTECTIVENESS STATEMENT

The remedy is considered protective in the short-term because there is no evidence of a cap breach, groundwater use, or exceedance of GSI calculated mixing zone criteria and thus no current exposure. Since the gas probes have not been installed however, there is no data which positively affirms that landfill gas is not escaping the landfill and migrating laterally. Therefore, in order for the remedy to be demonstrated to be protective and to remain protective in the long-term, the gas probes must be installed and monitoring of landfill gas or the lack thereof can be used to determine the protectiveness of the remedy.

XI. NEXT FIVE-YEAR REVIEW

The next five-year review will be completed by December 10, 2009, which is five years from the date of this five-year review.



VICINITY MAP

SOURCE: U.S.G.S. 7.5 MINUTE QUADRANGLE MAP OF KALAMAZOO AND PORTAGE, MICH., PHOTOREVISED 1973.

SITE PLAN

CLIENT/PROJECT								
			Golder Associates Lansing, Michigan			TITLE: SITE LOCATION MAP		
DRAWN: JJS	CHECKED	REVIEWED	DATE: 05/25/01	SCALE: 1" = 2000'	FILE NO.: 8326GSI-1	JOB NO.: 963-8326	DWG NO.	FIGURE: 1